

5.6 Properties of Linear Relations

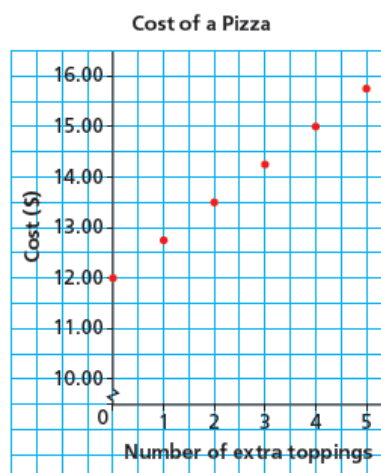
LESSON FOCUS

Identify and represent linear relations in different ways.

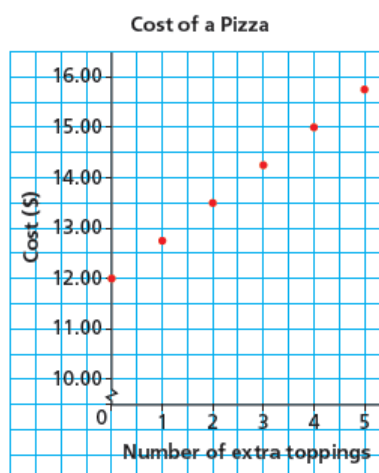
Make Connections

The table of values and graph show the cost of a pizza with up to 5 extra toppings.

Number of Extra Toppings	Cost (\$)
0	12.00
1	12.75
2	13.50
3	14.25
4	15.00
5	15.75



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0	12.00
1	12.75
2	13.50
3	14.25
4	15.00
5	15.75



What patterns do you see in the table?

Write a rule for the pattern that relates the cost of a pizza to the number of its toppings.

How are the patterns in the table shown in the graph?

How can you tell from the table that the graph represents a linear relation?

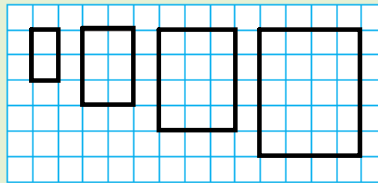
TRY THIS

Work with a partner.

You will need 1-cm grid paper.

Use this pattern of rectangles.

This pattern continues.



A. Draw the next two rectangles in the pattern.

Copy and complete each table of values for the 6 rectangles.

Width of Rectangle (cm)	Area (cm^2)
1	
2	

Width of Rectangle (cm)	Perimeter (cm)
1	
2	

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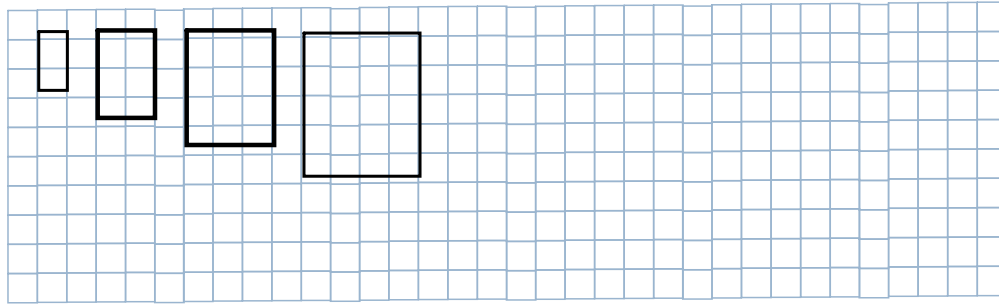
TRY THIS (continued)

B. Which table of values represents a linear relation? How can you tell?

C. Graph the data in each table of values.
Does each graph represent a linear relation?
How do you know?

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Draw the next two rectangles in the pattern.



Copy and complete each table of values for the 6 rectangles.

Width of Rectangle (cm)	Area (cm ²)

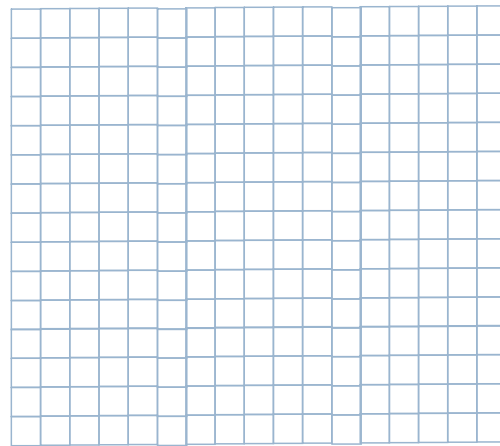
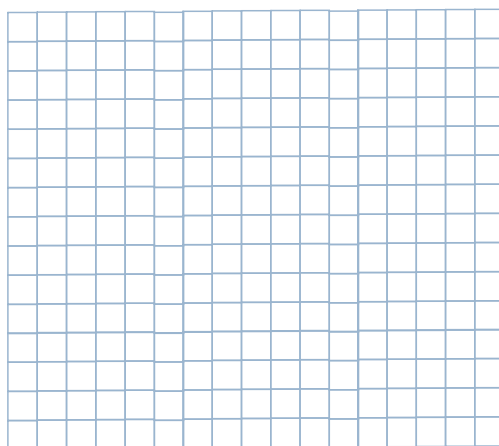
Width of Rectangle (cm)	Perimeter (cm)

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Which table of values represents a linear relation? How can you tell?

Graph the data in each table of values.

Does each graph represent a linear relation? How do you know?



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- * The cost for a car rental is \$60, plus \$20 for every 100 km driven.
The independent variable is the ? and the dependent variable is ?

→ We can identify that this is a linear relation in different ways. *

#1 a table of values

Distance (km)	Cost (\$)
0	60
100	80
200	100
300	120
400	140

* ?

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IS ?

→ We can identify that this is a linear relation in different ways. *

#1 a table of values

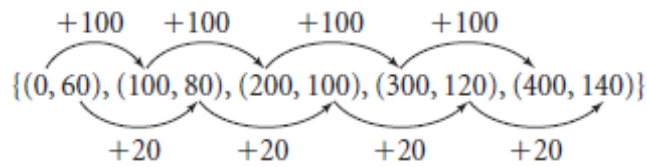
# of Km	Cost (\$)
0	60
+100 (100	80 } +20
+100 (200	100 } +20
+100 (300	120 } +20
+100 (400	140 } +20

\$60 to rent
a car
and
\$20/100 Km

#2 ■ a set of ordered pairs

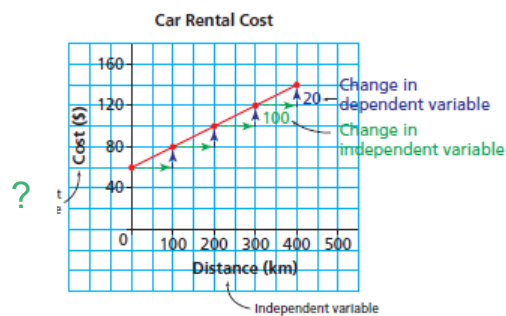
The difference in each x-value must be equal.

The difference in each y-value must also be equal.



#3 ■ a graph

A linear relation's graph will be one straight line in any direction.



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We can use each representation to calculate the **rate of change**. (aka "slope")

The rate of change can be expressed as a fraction:

$$* \frac{\text{change in dependent variable}}{\text{change in independent variable}} = \frac{\$20}{100 \text{ km}} = \$0.20/\text{km}$$